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T-2377

Job No.: CTCE/BBMP/W.No.10/RCN/CSR-04/016d/CEMENT/2016-17 Date: 21.04.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
*NAME OF THE WORK	:	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
*REFERENCE	:	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	19.04.2016
PERIOD OF TESTING	:	19.04.2016 to 21.04.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	135 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	490 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CTCE/BBMP/W.No.10/RCN/CSR-04/016d/SAND-Gradation/2016-17 : 21.04.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Chandranaik,**
No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.

*** Name of Work** : Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP,

Reference : EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 19.04.2016

Date of Testing : 21.04.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	92.00	90-100	90-100	90-100	95-100
2.36	75.50	60-95	75-100	85-100	95-100
1.18	52.00	30-70	55-90	75-100	90-100
600 Micron	24.50	15-34	35-59	60-79	80-100
300 Micron	10.30	5-20	8-30	12-40	15-50
150 Micron	3.30	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

Assistant Executive Engineer
Vidyaranyapura Sub Division
BBMP, Bangalore - 97

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.10/RCN/WMM/Gradation/2016-17 : 25.04.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Chandranaik,**
No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.

Name of Work : Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015

Date of Testing : 25.04.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **7960**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	265	265	3.3	96.7	95-100
22.4	2505	2770	34.8	65.2	60-80
11.2	1180	3950	49.6	50.4	40-60
4.75	995	4945	62.1	37.9	25-40
2.36	930	5875	73.8	26.2	15-30
0.600	850	6725	84.5	15.5	8-22
0.075	810	7535	94.7	5.3	0-8

Assistant Executive Engineer
Vidyaranyapura Sub Division
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Job No.: CTCE/BBMP/W.No.10/RCN/WMM/Gradation/2016-17 : 29.04.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Chandranaik,**
No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.

Name of Work : Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015

Date of Testing : 29.04.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **8340**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	210	210	2.5	97.5	95-100
22.4	2850	3060	36.7	63.3	60-80
11.2	1210	4270	51.2	48.8	40-60
4.75	1050	5320	63.8	36.2	25-40
2.36	965	6285	75.4	24.6	15-30
0.600	910	7195	86.3	13.7	8-22
0.075	890	8085	96.9	3.1	0-8

Assistant Executive Engineer
Vidyaranyapura Sub Division
BBMP, Bangalore - 97

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Job No.: CTCE/BBMP/W.No.10/RCN/WMM/AIV/2016-17 25.04.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of the Work	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	25.04.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines = $100^* (W_2/W_1)\%$	22.02	22.16	21.97

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Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.10/RCN/WMM/S-T/2016-17 25.04.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of Work	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	25.04.2016

Result : Flakiness Index = **11.95%**

Elongation Index = **13.06%**

Result : Combined Flakiness & Elongation index 25.01%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.10/RCN/SDBC/Bitumen/2016-17 23.05.2016

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
NAME OF THE WORK	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
SAMPLE I/D	Roads in Ramachandrapura and Doddabommasandra area in Ward No.10
DATE OF TESTING	23.05.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	473.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.50
7. Bitumen content in %	4.90	5.30
8. Average	5.10	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	33.12	6.97	6.97	93.03	90-100
4.75	259.6	54.60	61.56	38.44	35-51
2.36	32.62	6.86	68.42	31.58	24-39
1.18	42.32	8.90	77.32	22.68	15-30
0.3	45.31	9.53	86.85	13.15	9-19
0.075	37.12	7.81	94.66	5.34	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.25	6.45	6.45	93.55	90-100
4.75	259.6	51.92	58.37	41.63	35-51
2.36	58.37	11.67	70.04	29.96	24-39
1.18	45.23	9.05	79.09	20.91	15-30
0.3	36.32	7.26	86.35	13.65	9-19
0.075	41.22	8.24	94.60	5.40	3-8

Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore - 97

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Job No.: CTCE/BBMP/W.No.10/RCN/SDBC/AIV/2016-17 23.05.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of the Work	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
28.07.2014	23.05.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	21.20	21.56	21.38

Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore-97

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Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.10/RCN/SDBC/Shape_T/2016-17 : 23.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of Work	: Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.05.2016

Result : Flakiness Index = **11.25%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation index **25.15%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.10/RCN/SDBC/Stripping/2016-17 23.05.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of the work	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.05.2016

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.43	96.57
2	3.6		
3	3.3		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.10/RCN/SDBC/Sp_Wa/2016-17 23.05.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Chandranaik,** No.19, 17th Main Road, 72nd Cross, J.D. Halli, 5th Block, Rajajinagara, Bangalore – 10.
Name of the Work	Asphalting to roads in Ramachandrapura and Doddabommasandra area in Ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/193/2015-16 Dated: 03.02.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	23.05.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2027	2026	2025	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1272	1271	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2019	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	746	748	750	
6	Weight of oven dried aggregate	W_4 g	1999	2000	2015	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.680	2.674	2.687	2.680
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.750	2.743	2.705	2.733
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.95%	0.95%	0.25%	0.72%

Assistant Executive Engineer Vidyaranyapura Sub Division BBMP, Bangalore - 97

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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